IN THE

Supreme Court of the United States

NO. 661

OCTOBER TERM, 1957

KOPPERS COMPANY, INC., and WHEELING STEEL CORPORATION, Petitioners,
(defendants-appellees below)

v.

CARL OTTO, Respondent, (plaintiff-appellant below)

PETITION FOR A WRIT OF CERTIORARI TO THE UNITED STATES COURT OF APPEALS FOR THE FOURTH CIRCUIT

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CARL OTTO, Respondent. (plaintiff-appellant below)

PETITION FOR WRIT OF CERTIORARI

Petitioners pray this Court to issue a writ of certiorari to review a judgment of the United States Court of Appeals for the Fourth Circuit.

Opinions below

The opinion of the district court for the Northern District of West Virginia is reported at 147 F. Supp. 552, 112 USPQ 108, and printed in the joint apendix, Volume II, 266-323. The opinion of the appellate court is reported in 246 F. 2d 789, 114 USPQ 188, and printed in the appendix to this petition at pp. 32a to 59a.

Jurisdiction

This is a patent infringement suit. The judgment of the court below was entered July 10, 1957. Rehearing was denied September 18, 1957. This Court has jurisdiction under 28 U.S.C., Sec. 1254(1).

Questions presented for review

1. Where the trial court heard expert testimony, saw demonstrations, heard extensive testimony of the patentee-plaintiff, in its opinion discussed the evidence in detail, and in addition to many facts stated in its opinion, made twenty-four specific numbered "Findings of Fact," and based its decision that the patent in suit is invalid on the facts found,—was it error for the court of appeals to reject those findings and that decision without showing any mistake of fact, or error of law of the trial court in applying those facts, and reverse on its own *de novo* interpretation and restatement of the facts?

Rule 52a, Federal Rules of Civil Procedure
Graver v. Linde, 336 U.S. 271

2. Where, after repeated rejection of all the Otto claims as unpatentable, the Patent Office was led by false statements, and arguments based thereon, to allow basic claims, and the trial court found as a fact from extensive testimony and the record of application for the patent in suit, that *"the Patent Office was misled,"* was it error for the court of appeals to reject that finding,—merely saying that the appellate court *"cannot assume"* that the Examiner was misled?

Hazel-Atlas v. Hartford Empire, 322 U.S. 238
Precision Instrument Mfg. Co. v. Automatic, 324 U.S. 806

3. Where the patent in suit is admitted by respondent to be for a combination of old elements, and the trial court found there was no new functional result of the combination or any of its elements, did the court of appeals err in not applying the tests of invention for such patents required by decisions of this Court?

Lincoln Engineering Co. v. Stewart Warner, 303 U.S. 545

Cuno Engineering Corp. v. Automatic Devices, 314 U.S. 84

Great Atlantic and Pacific Tea Co. v. Supermarket, 340 U.S. 147

Jungersen v. Ostby, 335 U.S. 560.

4. Did the amended patent statute of 1952 lower the standards for patentable invention previously established by this Court?

[Cases cited under question 3, and cases showing confusion listed at page 23 of our argument.]

Statement of the case

This is an action for infringement of Otto patent No. 2,599,067, issued to patentee-plaintiff-respondent, June 3, 1952. It arises under 28 U.S.C., Sec. 1338(a). The patent was held invalid by the District Court for the Nothern District of West Virginia. That judgment was reversed by the United States Court of Appeals for the Fourth Circuit.

The patent claims a process and apparatus by which ammonia is removed from the coal gas generated in by-product coke ovens. That is done by causing a solution containing sulphuric acid to react with the ammonia in a gas-scrubber, here called an "ammonia saturator", to form ammonium sulphate, which is eventually removed in crystal form. Intimate surface contact of sulphuric acid and ammonia in the scrubber is brought about in the patented structure and process by *spraying* liquid through the coke oven gas in an *unobstructed* ("empty") "scrubbing chamber." The "spray" is produced by pumping acidified liquid, (known in the art as "mother liquor,") through conventional spray-forming nozzles.

The prior art shows *inter alia* (and the trial court found) that it was known before Otto that reaction of sulphuric acid and ammonia is brought about by *surface* contact of the liquid acid and the gaseous ammonia, that spraying liquid in finely divided form through a gas to remove some element (and specifically ammonia) from the gas has long been known as an effective "tool of the chemical art," and that scrubbers for removing ammonia from coke oven gas by spraying sulphuric acid solution through the gas in open scrubbing space, thereby converting the ammonia into ammonium sulphate that is thereafter removed in solid crystal form,—had been used and patented long before Otto's claim of invention.

Controlling facts as to the prior art and as to the nature of Otto's alleged invention are set out in specific numbered findings of fact by the trial court and in other statements of fact in the opinion (II, pages 266-323). All of the findings of the trial court are supported by substantial evidence, much of it in the testimony of Otto, the plaintiff-patentee-respondent,—and his expert witness, Radasch.

The decision of the appellate court makes no mention of any of the findings of fact or conclusions of law or the opinion of the trial court. Instead it arrived *de novo* at numerous indirect findings not supported by the record, and contrary to and incompatible with those of the trial court. It seems clear that the decision on appeal could be reached only by rejecting the fact findings of the trial court, by disregarding the decisions of this court on the standards of patentable invention, or by considering that the 1952 amended patent statute (35 U.S.C. Secs. 103 and 282) changed the standard of invention required to support validity of a patent as previously established by this court.

ARGUMENT

I. The appellate court rejected or ignored the trial court's findings, and substituted its own findings and conclusions, contrary to FRCP 52a, and contrary to proper judicial procedure.

We respectfully submit that the appellate court has so flagrantly departed from the accepted and proper course of judicial procedure as to call for an exercise of this Court's supervisory authority to correct judicial error in this case, and to prevent its repetition in other courts below.

In effect the instant decision reduces the function of the trial court to the mere making of a record to be used as basis for *de novo* weighing and interpretation of the evidence, and primary decision by the court of appeals. In this case the trial court's analysis and application of conflicting expert and fact testimony, on controlling issues, has been completely rejected or ignored.

As we undertand FRCP 52(a), and the interpretation of that rule by this court, the fact findings of a trial court are to be rejected *only* where the appellate court determines from the evidence that the findings below are *clearly erroneous*. This case presents a flagrant violation of that rule.

The district court conducted a trial lasting two weeks. It heard extensive expert and fact testimony, saw demonstrations, and heard much testimony by the patentee-plaintiff-respondent. After oral argument, and after filing of briefs, it held the case under advisement several months. It then filed an exhaustive opinion discussing the evidence, its bearing on the basic issues in detail, and applied this Court's tests of patentable invention to the facts established by the record.

It made twenty-four specific findings of fact, besides numerous statements of facts in the body of the opinion, based on evidence discussed in the opinion.* If those findings are accepted it would be *impossible* to hold the Otto patent valid,—unless there has been a statutory lowering of the standard of patentability. *There is no assertion by the appellate court of error in any fact findings by the District Court.*

Such procedure in treatment of fact findings is directly contrary to the requirement of FRCP 52(a):

> "*Findings of fact shall not be set aside unless clearly erroneous*, and due regard shall be given to the opportunity of the trial court to judge of the credibility of the witness."

In commenting on that rule this Court has said:

> "The rule *requires* that an appellate court make allowance for the advantages possessed by the trial court in appraising the significance of conflicting testimony and *reverse only 'clearly erroneous'* findings." *(Graver Tank & Mfg. Co. v. Linde Air Products Co.* 336 U.S. 271, 275.)

In that *Graver case* the trial court held certain process claims invalid *upon the basis of definite findings of fact.* The circuit court of appeals reversed. *This Court reinstated the judgment of the trial court, saying:*

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* (For convenience of this Court those numbered findings are printed in the appendix to this petition at pages 27a to 31a).

* All emphasis in quotations has been added, unless otherwise noted.

* Reference to the record ("I", "II") are to the two volumes of the printed joint appendix to the appeal briefs below.

"* * But the record in this case, while not establishing to a certainty that the findings are right, falls far short of convincing us that they are *clearly erroneous. We think that the rules that govern review entitle the trial court's conclusions to prevail* and that the process claims are invalid under the statute." (p. 279)

In arguing other points later we show a number of specific instances where the appellate court, without showing a mistake, rejected specific findings of fact of the trial court, and substituted its own assumption or statement of fact. These are discussed in Sections I-(a), II, III, III-(a) (b) (c) (d) and (e) of our argument.

I-(a). The trial court found as a fact that there was public use in prior commercial saturators of basic features of the Otto patent. The appellate court rejected those findings and merely treated such prior installation as an "abandoned experiment."

Petitioners proved, and the trial court found, that prior to Otto the *spraying* of mother liquor containing ammonium sulphate crystals, to which sulphuric acid has been added, into an unobstructed scrubbing space through which coke oven gas was continuously passed, had been commercially used for nearly two years, in four ammonia saturators, to treat all of its coke oven gas, at a large plant of the Bethlehem Steel Company. (Findings of Fact 18, 19 and 20, II 321-2, and appendix to this petition at page 30a).

Those saturators are discussed in detail in the testimony of defendants' witness *Stout* I, 76,-88; *Helm* at I, 100-103, 114-16, and *Lowry* at 173-4. Plaintiff-Respondent's expert *Kadasch* discusses them at I, 150, 155-57, and his witness Farinet discusses it at 169-173. Defendants' Exhibit No. 14, a chart showing in simplified form the Bethlehem saturator, is at II, 413. The opinion of the district court discusses these Bethlehem saturators at II, 300.

In spite of such findings and analysis below, and in direct contradiction thereof, the appellate court treated the Bethlehem saturator as merely an "abandoned experiment." (Appendix to this petition, pages 51a and 52a).

II. The trial court found as a fact that the Patent Office Examiner was deceived ("misled") by unfounded statements of fact and arguments thereon, and as a direct result allowed claims in the patent in suit. The appellate court rejected those findings, merely saying that it "cannot assume" the Examiner was misled.

Otto argued to the Patent Office that his nozzle discharges a "spray" having a "whirling motion" and that *such a spray* has a functional result in that it improves the surface contact of liquor and gas and so produces increased efficiency. *The Examiner accepted that untrue statement and unfounded argument and upon that basis for the first time allowed basic claims contdining "that whirling spray element", stating:*

> "Claim 61 [now claim 1 of the patent in suit] defining the particularly whirling motion of the finely divided spray droplets, *stated* [by Otto] *to give an improved contacting between the crystals containing liquor and the gas being treated and thereby an improved yield*, is considered to be allowable as are the dependent claims 62-64. [claims 2-4 of the patent]." (Quoted in trial court's opinion, II, 286.)

The trial court said:

"The Court is *convinced* that the Examiner understood from Otto's presentation and arguments that the *inventive feature* of these claims, Nos. 1, 2 and 4, *and even others, was based on the novelty and value of that whirling spray element.*" (II, 284)

It found as a fact:

"21. *The Patent Office was misled* by arguments that Otto's contacting the gas and liquid was effected by spraying the liquid with a 'whirling motion.' Some of the claims in suit were allowed because of inclusion of that element. *There is no such thing as a 'whirling spray' in the sense that term was used in arguments to the Patent Office, and in the sense that such term is used in the claims in suit.*" (II, 322, and in appendix to this petition, page 31a.)

Nevertheless, the court of appeals brushed aside the testimony and the findings based on it, merely saying:—

"* * * we *cannot assume* that the Examiner * * * could have supposed that the droplets, after leaving the nozzle, would take a course in defiance of elementary laws of physics." Appendix, page 58a.

Deception or misleading of the Patent Office by an applicant for patent has been condemned in no uncertain terms by this Court.

Hazel-Atlas Glass Co. v. Hartford-Empire Co., 322 U. S. 238;

Precision Instrument v. Automatic, 324 U. S. 806.

III. The appellate court did not follow the decisions of this court in applying proper tests of validity to a patent for a combination of old elements without proof of new and non-obvious results of the combination.

Otto's attorney admitted that—

"All of the elements which go to make it [the Otto patented invention] up were old and readily available to workers in the art." (II, 289)

The trial court found from the evidence that there was no new element in, or new functional result of, the Otto patented saturator. (Findings 6-9 and 12-16).

The appellate court in reversing ignored the material fact findings just above noted. So doing it failed to scrutinize the patent in suit—

"with a care proportioned to the difficulty and improbability of finding invention in an assembly of old elements,"—

as directed by this Court in *Great Atlantic and Pacific Tea Co. v. Supermarket Equipment Corporation*, 340 U.S. 147, 152:

"This case is wanting in any unusual or surprising consequences from the unification of the elements here concerned, and *there is nothing to indicate that the lower courts scrutinized the claims in the light of this rather severe test.*

"Neither court below has made any finding that old elements which made up this device perform any additional or different function in the combination than they perform out of it."

It is material to note here that *the trial court did scrutinize the claims in the light of this rather severe test and did cite and follow the decisions of this Court* regarding patentability of combinations of old elements.

The appellate opinion merely says that the Otto all-spray saturator was hailed as "revolutionary," and that its performance was "far superior" to prior saturators. In arriving at that conclusion the appellate court was misled by *ex parte* statements found in certain plaintiff's documentary exhibits which compared the productive output of the Otto 1946 spray type saturators with "worn-out," "obsolete" (1917) saturators of a different design (I, page 100). This is like comparing the speed and load capacity of a new 1957 Cadillac with a worn-out 1917 Model-T Ford, to establish patentability of the Cadillac.

When proper comparison of operative results of the patented Otto saturator is made with the 1946 competitive prior art saturators, the evidence shows that except as to space requirement and convenience of operation, the Otto all-spray saturator is not significantly superior in respect to (a) cost of installation, or (b) cost of operation, or (c) removal of ammonia, or (d) formation of ammonium sulphate crystals. I, pages 110-112.

The diesel railroad locomotive, balloon tires, tubeless tires, four wheel automobile brakes, etc., are examples of "revolutionary" commercial success and practical advantages "far superior" to what was displaced in the commercial practices, but not establishing patentable invention over prior art knowledge available to the public.

In the present case lack of invention is so clear, that to permit the decision of the court of appeals to stand would amount almost to construing the patent law to require that the *first* person to *place a useful and commercially successful device on the commercial market* by employing "old tools of the art", would be entitled to a patent monopoly.

III-(a). The trial court found from the testimony that Otto's all-spray saturator was a "natural evolution" in an old art, merely using known "tools of the art", made desirable by increasing volumes of coke oven gas that had to be treated, without any new functional effect. Nevertheless, the appellate court rejected those findings of the trial court because of commercial history.

The opinion of the trial court found from the evidence that desirability of shifting to the prior art well-known all-spray type saturators arose during World War II. Prior to that period other types had been standard and satisfactory practice. The evidence shows that during this period (1942-46) Underwood, Otto, and Koppers each independently turned to the long-known use of sprays to increase the volume of gas that could be handled in available space. The trial court said:

> "It is a *natural evolution of the art* to change the saturators to handle more coke oven gas and it was most desirable to take care of it within the same space occupied by existing saturators because many of the steel companies have little extra space available. *So the art turned to the old tool of the art*, the spray method of bringing the sulphuric acid solution into contact with the coke oven gas. *Otto himself admitted that the spray method of treatment of gases was old, well-known to the art and a tool of the art.*" (II, 302)

Argument.

The opinion of the court of appeals gives great weight to its *assumption* that Otto *solved a problem* which others had tried to solve without success. *The record does not support that conclusion.* The appellate opinion cites no supporting evidence. The prior art patents and his own testimony show there was no "problem" solved by Otto. Note findings 3-9 and 12, at II, 319-20, and at appendix to this petition, pp. 27a, 28a and 29a.

The opinion of the court of appeals below not only rejected findings that Otto solved no long-standing problem, and produced no new functional effect,—merely using old tools of the art,—but also it divided the prior art into two classes, (a) the "cracker pipe" type which passed the coke oven gas through a pool of *"saturated"* mother liquor, and (b) the "packed tower" type which contacted the gas with *"unsaturated"* mother liquor flowing down over grids in a scrubber. Having made this classification, the appellate court said:

> "No one in commercial practice had combined principles of the two systems in one installation." (Appendix, page 10a).

That reasoning and that statement completely ignore the fact shown by the record and stated in the opinion of the trial court that the prior art had done just that and to the same extent that Otto did it. The trial court found and the record shows that the removal of ammonia from coke oven gas by spraying *"saturated"* mother liquor through coke oven gas in an unobstructed scrubbing space had been patented and used before Otto. That appears *inter alia* from the Tiddy patent and the Bethlehem commercial use, and the trial court's analysis of the evidence concerning that and other prior art. The

appellate court made an *assumption* which, in effect, attributed to Otto an "inventive concept" which is clearly negatived by the facts established in the record and stated by the trial court. Only by rejecting those facts could the appellate court give Otto credit for invention in the use of *saturated* mother liquor in an *empty* scrubber through which the gas is passed.

Of course, if a trial court applies an improper *standard of invention* to the facts found, its decision on patent validity might be reversed without rejecting specific findings of fact. But here the court of appeals points out *no such error of law by the trial court.* On the contrary, the trial court specifically cited and applied the *standard of invention set forth by this Court* in the cases discussed in its opinion at II, p. 310, 311, 315 and 316. The opinion of the court of appeals makes no mention of that standard. It reverses on its own standard, apparently relying chiefly on commercial success, the amended patent statute, and presumption of validity.

The standard of invention to be applied in judging a method patent was further stated by this Court in *Jungersen v. Ostby, et al.*, 335 U.S. 560, 566-7. There the plaintiff asserted a "revolutionary" method of casting jewelry and like intricate shapes. This Court said:

> "* * * The patentee claims that the centrifugal forcing of wax into the primary mold *had never before been combined with the other features of his process. We think this fact is of no legal significance.* [Citing cases] * * * (566)

"Thus Jungersen employed in his claimed invention *well known skills and practices in a manner and for a purpose long familiar in the field of casting.* His claimed improvement is therefore not patentable. * * * (566-7)

"The fact that this process has enjoyed considerable commercial success, however, does not render the patent valid." (567)

III-(b). Otto's own specific admissions negative invention. Although quoted extensively and relied on by the trial court in its findings and decision, those admissions are not discussed or given any weight in the appellate opinion.

The trial court quoted at length admissions of the plaintiff-patentee-respondent, and found them *devastatingly material* (II, 276-284). *The appellate court did not even refer to Otto's testimony or to the trial court's weighing of that evidence.*

Before the trial court, Otto's attorney argued that Otto's disclosure involved *three distinctions over the prior art* (II, 275-6):

1. The use of *Spraco nozzles;*
2. Spraying into an *"unobstructed space;"* and
3. Spraying *liquor containing crystals.*

Every one of these basic "distinctions" is demolished by Otto's own admissions.

Otto testified inter alia: (a) that spraying a liquid through a gas in an unobstructed space to remove an element of the gas by chemical reaction in such space was a "tool of the chemical art" (I, 194); (b) that designing apparatus to use sprays to remove ammonia from coke oven gas was merely a matter of engineering (I, 209); (c) that he made no invention in selecting the then commercially-available and well-known "Spraco" nozzles (I, 38); (d) that his use of "saturated" mother liquor "containing entrained crystals" for spraying through coke oven gas was *merely incidental* to using the "ordinary mother liquor" produced by and found in prior art saturators (I, 52); (e) that the presence of "entrained" ammonium sulphate crystals in mother liquor was incidental and *could have been avoided by him only by "expensive and unnecessary" treatment* of the mother liquor (I, 215); (f) that production of ammonium sulphate crystals in the Otto patented process takes place for the most part after the sprayed liquor has passed through the scrubbing space (patent column 3, lines 62-65) (II, 369); and (g) that the "unobstructed space" referred to in his patent merely means an "empty" scrubber through which the gas flows (I, 201).

III-(c). The trial court found as a fact that prior art not cited by the Patent Office was material as showing lack of invention by Otto, and destroying the presumption of validity. The appellate court rejected those findings and treated that prior art and the extensive testimony concerning it as immaterial.

To negative invention by Otto, petitioners introduced several prior art patents, and a publication, that *had not been cited by the Patent Office.* Of these, both *Becker* (II, 422, Chart II, 432) and *Doherty* (II, 418, Chart II, 428) show all-spray-nozzle saturators for removal of ammonia from coal gas. The *Hutte Chemists Handbook* (II, 424, Chart 436) shows generically the all-spray-nozzle method of scrubbing an element from a gas by spraying liquid through the gas in an ("empty") unobstructed chamber. *Bosch,* (II, 420, Chart 430) shows an unobstructed spray-nozzle scrubber for removing oxides of nitrogen from a gas. *Tiddy* (II, 450) shows the complete Otto process, except for different spray-producing mechanism.

Referring to the prior art just above listed the trial court found as a fact:

> "17. Some of the most pertinent prior art now before the court was not cited by the Patent Office." (II, 321, appendix to this petition, page 29a).

See also discussion on the point by the district court at II, 289-293.

The appellate court makes no mention of Becker, Doherty, Hutte, or Bosch. By disregarding that finding and the discussion of the trial court, the appellate court gave undue weight to the presumption of validity of the patent in suit arising from its grant. Apparently it construed 35 U.S.C. Secs. 103 and 282 as changing the law to *lower* the standard of patentable invention, and to make determinative the presumption of validity, in the absence of direct, complete, and specific anticipation.

III-(d). The trial court found from the testimony inter alia that the Tiddy prior patent discloses the "basic process" of the patent in suit. The appellate court disregarded that finding, the admissions of respondent's expert witness regarding it, and treated Tiddy as immaterial.

We urge this point, not as a reargument of merits, but as showing error of procedure in the appellate court.

The Tiddy patent (II, 450) describes the removal of ammonia from coke oven gas by "spraying" the identical "mother liquor" specified by Otto, throughout the gas in an unobstructed scrubbing space. As the trial court said (II, 297) substantially the only difference between the Otto and Tiddy processes is that *to produce* their respective "sprays" of mother liquor, Otto used pressure *nozzles*, whereas Tiddy used rapidly *rotating cylinders* dipping into the liquor bath.

The trial court discussed the Tiddy patent and the testimony, particularly the very material admissions of respondent's expert witness concerning it (II, 295-300), and concluded—

> "This would seem to be the *basic process which plaintiff seeks to cover in his spray patent.*" (II, 296)

Argument.

The appellate court's opinion disregards the expert testimony and the trial court's findings of materiality of the Tiddy patent, because—it says—

"Tiddy stated that the *principal* object of his device was to produce ammonium sulphate crystals *larger* than those produced in the ordinary saturator. * * *" (Appendix page 49a);

"The [Tiddy] liquor bath was in an *elongated* reservoir. * * *" (Appendix page 49a);

"The device of the Tiddy patent bears little *resemblance* [in appearance] to the well-known spray scrubbers. * * *" (Appendix page 50a);

"Tiddy, himself, by 1941, had *turned back* to scrubbers operating on the unsaturated system * * * and later * * * *obtained two patents upon claimed improvements.* * * *" (Appendix page 50a);

"The *emphasis* of his [Tiddy] patent No. 1,997,757, was not on the method of obtaining the reaction but on the *depth* of the bath in which the crystals grew. * * *" (Appendix page 50a);

"The Tiddy patent had been *public knowledge for more than eleven years*, but neither the patentee nor the highly skilled engineers of the defendant turned to it." Appendix page 50a.

Tiddy and its material effect on the patent in suit are set forth in the trial court's opinion beginning at the bottom of II, 295. Its discussion and findings are based largely on extensive testimony of respondent's expert Radasch (I, 147-9). We submit that it was clear error of law and procedure that the trial court's findings were set aside or disregarded on such superficial basis as that indicated by the quotations just above.

III-(e). The appellate court substituted its own fact findings, interpretations, and application to this case of the Jeremiassen prior patent for those of the trial court, and the testimony of the expert witnesses.

Both parties to this suit agree that the Jeremiassen prior art patent (II, 374, Chart II, 438) describes removal of ammonia from coal gas by passing a "shower" of drops of "*saturated*" mother liquor through an empty ("unobstructed") scrubbing space, to free coal gas of ammonia, by *converting the ammonia in the scrubber* into ammonium sulphate. That disclosure is indisputably *pro tanto* common to Jeremiassen and Otto. That is the essential feature, the "crux and essence," the "heart" of the Otto patent in suit as found as a fact by the trial court *on the basis of Otto's own testimony*. See district court's opinion at II, pp. 316, and its fact finding 3.

The Patent Office repeatedly held that Jeremiassen's disclosure negatives invention by Otto. It was only by the *false* argument of advantage of using a "whirling spray" in the Otto saturator that the rejection on Jeremiassen was at long last overcome.

The trial court, after consideration of all the evidence disposed of the various attacks on Jeremiassen in part as follows:

> "* * * Jeremiassen teaches that he depends entirely on a finely divided sulphuric acid and ammonium sulphate liquor passed through an unobstructed scrubbing space to react with ammonia and to produce ammonium sulphate. He refers to the liquid entering the unobstructed scrubbing space as a *shower of streamlets or jets* and creating a veil of liquid through which the gas must pass. He

describes his process as producing the desired 'very large contacting surface between the liquid and the gas,' resulting in the production of ammonium sulphate crystals, the larger crystals of ammonium sulphate settling to the bottom of the crystallizing chamber where they are removed. It is true that Jeremiassen intends to avoid the use of sprays in his process, but plaintiff's expert witness *Radasch admitted that whether Jeremiassen's shower of sulphuric acid was called 'sprays' or not it would be effective to remove the ammonia from coke oven gas.*" (II, 294-5)

The appellate court sidestepped the trial court's weighing of the evidence concerning the Jeremiassen disclosure by substituting its own interpretation of that patent, the expert testimony of both parties concerning it, and its place in the art.

IV. The appellate court apparently construed the amended statute of 1952 as lowering the standard of patentable invention. That raises an important question of federal law which has not been but should be settled by this court.

In the *Great Atlantic & Pacific Tea case*, and other cases cited above, this court has set up a standard of invention higher than lower courts were previously applying. See opinion of Judge Learned Hand in *Lyon v. Bausch & Lomb*, 224 F. 2d 530.

When the amended patent act of 1952 was passed (35 U.S.C. sections 1-293) it contained a *new* section 103 which stated certain considerations determining patentable invention, and a section 282 for the first time making presumption of validity statutory. Ever since the pas-

sage of that amended act there has been controversy among counsel and in the lower courts as to whether it *lowered* the standard of invention as established by prior decisions of this court. There is continuing material conflict on this point in the lower courts.

That confusion is summarized by District Judge Galston in an article entitled "Invention and the Obvious" (13 FRD 463). After quoting a paragraph from the opinion of this court in *Marconi Wireless Telegraph Co. v. United States*, 320 U.S. 1, regarding the difficulties encountered by the courts with the standards required for patentable invention, Judge Galston said:

> "Now after waiting years for a new patent statute, Section 103 of the new Act leaves these same American judges in the handicapped position referred to by Justice Frankfurter." (p. 468)

It was argued on behalf of respondent in the case at bar in both the trial court and the court of appeals that the 1952 statute *lowers the standard of invention* as stated by this court. Apparently, in effect, the court below agreed with that argument, although its opinion makes no reference to it. Certainly, however, it made no effort to show that the patent in suit meets the standard of invention stated *inter alia* in the *Atlantic and Pacific case, supra*, which had been cited and followed by the district court.

This Court has in the present case an opportunity to resolve the confusion in the lower courts as to the effect of the 1952 statute.

Examples of opinions that the 1952 amended patent *statute lowered* the standard of invention are:

Lyon v. Bausch & Lomb Co., 224 F2 530; (CCA 2, Judge Learned Hand)

Gentzel v. Manning, 230 F2 341, (CCA 2, Clark, C. J.)

Pacific Contact Laboratories v. Solex, 209 F2 529 (CCA 9)

Blish et al. v. Time Saver Tools, Inc., 236 F2 913 (CCA 10)

L-O-F Glass Fibers Co. v. Watson, 228 F2 40, (CA D. C.)

Examples of opinions to the effect that there has been *no statutory change* in the requirements of patentable invention are:

General Motors v. Estate Stove Co., 203 F2 912, (CCA 6)

Borkland v. Pederson, 244 F2 501 (CCA 7)

In re O'Keefe, 202 F2 767, (CCPA)

Opinions indicate *uncertainty* as to the effect of the 1952 statute *within a particular court of appeals*. For example note these cases.

There has been no change:

Stanley Works v. Rockwell, 203 F2 846, (CCA 3)

There has been a change:

Palmer Co. v. Luden's Inc., 236 F2 496, (CCA 3)

Fisch v. Gould, 246 F2 5 (CCA 3)

Conclusion

The controversial question of whether the amended patent statute 35 U.S.C. Sections 103 and 282 have lowered the standard of invention as established by this Court, is inherent in this record.

This case is of great importance to the public, to the patent system, and to orderly treatment of trial records by proper appellate procedure. If the present decision stands, Otto will have a validated patent in spite of the finding of the trial court that the "crux and essence" and the "heart" of the patented invention, as stated in the testimony of the patentee-respondent, were disclosed and patented in the prior art. That would prevent the public from using known "tools of the art."

The court of appeals brushes aside *specific findings of misrepresentation to the Patent Office* by respondent, regardless of the gravity with which this Court has treated such deception. The appellate court on this issue *substitutes its personal present knowledge* for what it *thinks* the Examiner *should* have known. It ignores the established *fact* that the Examiner *was misled.* It validates deception.

The trial court obviously gave the record thorough study. It analyzed the patented claims and the pertinent prior art in detail. *It cited and followed the principles for testing patentable invention established by this Court.* It made numerous findings of specific facts, based on evidence detailed by it.

The opinion of the court of appeals, on the other hand, *makes no mention whatever of the findings and analysis of the evidence by the trial court.* It disregards prior art specifically found material by the trial court. It in effect makes new findings of fact and conclusions destructive of and incompatible with the findings of the trial court. It recasts and restates the factual background to *argumentatively* support its overall *conclusion* that Otto *must* have made an invention *because* his patented saturator has proved commercially popular, and that his patent must therefore be *presumed* valid.

It is clear that the court of appeals has decided issues relating to patentable invention contrary to applicable decisions of this court and contrary to FRCP 52a; that it has so far departed from proper judicial procedure as to call for an exercise of this Court's supervision and correction, to protect the public interest, and to secure uniform procedure below; and that it has decided an important question of federal law which has not been but which should be settled by this Court.

Respectfully submitted,

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December 10, 1957.

APPENDIX

Patent Statutes.

35 USC § 103. Conditions for patentability; non-obvious subject matter.

> A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

35 USC § 282 Presumption of validity; Defenses.

> A patent shall be presumed valid. . . .

Findings of Fact of the Trial Court.

1. The two spray-type saturators alleged in this suit to infringe the Otto spray patent were designed and installed in 1952 by defendant Koppers, and have since been used by defendant Wheeling at Follansbee, West Virginia, in this judicial district.

2. This patent in suit describes and claims five different forms of saturators for removing ammonia from coke oven gas. Of these five forms, only one installation as shown in Fig. 1 of the patent has been built by Otto. No saturators of the forms shown in Figs. 2 and 5 have been built. All the other saturators built by Otto under this patent have been as shown in Figs. 3 and 4, although Otto's saturators as successively installed have progressively varied in improved detail.

3. The essential feature of this Otto patent is spraying "mother liquor" containing crystals of ammonium sulphate, to which sulphuric acid has been added, through nozzles into an unobstructed scrubbing space through which coke oven gas is continuously passed.

4. "Mother liquor", drawn from a normal crystallizing pool, inevitably contains small crystals of ammonium sulphate. This has been true of all prior art saturators.

5. In the methods of spraying "mother liquor" through coke oven gas described or used prior to 1946, the liquor sprayed was obtained by drawing part or all of it from a mother liquor pool.

Findings of Fact of the Trial Court.

6. Prior art here of record shows that "mother liquor" containing ammonium sulphate crystals had been disclosed and used to remove ammonia from coke oven gas by spraying it in finely divided form through coke oven gas in unobstructed spaces.

7. Chemical engineers well knew prior to 1946 that effective contact of a liquid and a gas, for producing chemical reaction, absorption, or cooling, could be obtained by spraying the liquid through the gas in an unobstructed scrubbing space.

8. Chemical engineers well knew before 1946 that effective surface contact of a liquid and gas could be brought about by passing the liquid through the gas in the form of spray, shower or mist.

9. It was well known before 1946 that the finer the droplets of liquid passing through a gas, the greater the surface contact produced by any given amount of liquid, and consequently the more effective and rapid was the chemical reaction of the gas and the liquid constituents.

10. In the crackerpipe type of saturators used before 1946, coke oven gas was forced under pressure into a pool of mother liquor and passed through the pool in the form of gas bubbles, thus obtaining surface contact of gas and liquid.

11. The crackerpipe type of saturators in use for many years effectively removed the ammonia from coke oven gas.

12. No new or different chemical reaction results from the use of Otto's spray-type saturator and none is claimed.

13. The spray nozzles described in and claimed as essential elements in this patent were not invented, designed or modified in any way by Otto. He found them ready made, on sale to the public as "Spraco Nozzles", in conventional forms, adapted to produce either coarse or fine sprays. Such nozzles are described by U. S. Patent No. 1,101,264 to Eneas, issued in 1914.

14. Defendant Koppers had used Spraco nozzles such as those specified in the Otto patent in suit as early as 1926.

15. By Otto's own admissions, the spray nozzles, tar remover, acid catcher, crystallizing basin, means for controlling the size of ammonium sulphate crystals, means for continuously supplying additional sulphuric acid, means for recirculation of "mother liquor" from the crystallizing basin to the scrubbing chamber, etc., were not original with him and were known and used in commercial saturators before 1946.

16. By Otto's own admissions, it was a matter of engineering to design an apparatus for carrying out his process of removing ammonia from coke oven gas by spraying mother liquor through the gas.

17. Some of the most pertinent prior art now before the Court was not cited by the Patent Office. (See written opinion.)

Findings of Fact of the Trial Court.

18. In 1942 the Bethlehem Steel Company, at Bethlehem, Pennsylvania (through Underwood, its employee), modified four of its five existing crackerpipe saturators by putting in perforated "spray-pipes" above the surface of the mother liquor pool in the saturators. Mother liquor containing entrained crystals was forced through holes in the spray pipes and the streams of liquor so produced were distributed by splash plates to cause the liquor in finely divided form to pass through the coke oven gas in the unobstructed space above the pool, and thereby removed some of the ammonia.

19. The installation of the Bethlehem spray pipes was expensive, required several weeks of work of installation for each saturator. Two old crackerpipe saturators were first so equipped and put in operation. Later, two other saturators were similarly equipped and put into operation. From some time in 1942 until 1944, the coke oven gas produced at that Bethlehem plant was treated in these combined crackerpipe and spray saturators to remove the ammonia. While these installations did not operate too satisfactorily, they were used commercially during that period.

20. The splash type of liquid distribution used at Bethlehem for projecting liquid through gas was an old, well known and effective apparatus for producing sprays. Splash type sprays had been used in commercial saturator installations of Koppers prior to 1943.

21. The Patent Office was misled by arguments that Otto's contacting the gas and liquid was effected by spraying the liquid with a "whirling motion". Some of the claims in suit were allowed because of inclusion of that element. There is no such thing as a "whirling spray" in the sense that term was used in arguments to the Patent Office, and in the sense that such term is used in the claims in suit.

22. The two Wheeling saturators, installed by Koppers in 1952, use Spraco nozzles for spraying the liquid into the coke oven gas in an unobstructed space.

23. Other companies erect saturators of this spray type construction and use the method substantially as Otto describes in his patent.

24. Otto has no licensees under his patent and this is the first suit by him charging infringement by anyone.

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Opinion of the Appellate Court Below.

HAYNSWORTH, Circuit Judge:

This is a suit for infringement of Patent No. 2,599,067, for the production of ammonium sulphate, which was issued to the plaintiff, Otto, on June 3, 1952, upon an application filed March 15, 1948. From a judgment holding the patent invalid for anticipation, the plaintiff has appealed to this Court.

The claims of the patent relate to a method of producing ammonium sulphate in crystalline form by reacting ammonia in coke oven gas with an acidified saturated ammonium sulphate solution entraining crystals of ammonium sulphate. The basic method claims 1, 2, 4, 7 and 8 and the basic apparatus claims 14, 15, 16, 18 and 19, which are claimed to be infringed, are set forth in the margin.

Since the underlying principle was not new with Otto, the problem will be clarified by reference to the art as practiced in commercial installations in coke oven

1. The method of continuously producing sulphate of ammonia which comprises passing into a substantially unobstructed scrubbing space a gas containing free ammonia, contacting such gas with saturated ammonium sulphate solution containing free sulphuric acid, withdrawing ammonium sulphate liquor to make up such solution from a body of ammonium sulphate liquor in a crystallizing space below said scrubbing space, said contacting being effected by spraying by whirling motion and under such pressure so as to disperse said solution in fine spray over substantially the whole cross sectional area of the space and permit solid crystalline particles and supersaturated liquid spray to fall into said body whereby the growth of ammonium sulphate crystals in said body is promoted, withdrawing crystals from said crystallizing space

by-product plants prior to the time of the claimed invention in 1946.

Coke oven gas normally contains ammonia. If subsequent use of the gas is to be made, the ammonia is a deleterious substance and it is essential that substantially all of it be removed. The record indicates that a residue of as much as 3% of the ammonia content of the gas will be unacceptable in commercial practice. A residue of less than 1% is desirable.

It was well-known that ammonia readily reacts with sulphuric acid to produce ammonium sulphate. Passing

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and adding sulphuric acid to the liquor to make up for the acid combining with ammonia in the scrubbing space.

2. A method as specified in claim 1, in which the liquor introduced into said scrubbing space entrains ammonium sulphate crystals.

4. A method as specified in claim 1, in which the acid content of the liquor sprayed into the scrubbing space adjacent such gas inlet is about 5 or 6 per cent by weight, and in which the acid content of the liquor sprayed into said scrubbing space more remote from said inlet exceeds the first mentioned acid content.

7. The method of continuously producing sulphate of ammonia which comprises passing into a substantially unobstructed scrubbing space a gas containing free ammonia, contacting such gas with saturated ammonium sulphate solution containing free sulphuric acid and entraining solid crystalline particles and reacting with the free ammonia to form supersaturated ammonium sulphate liquor, withdrawing supersaturated ammonium sulphate liquor from said scrubbing space and desupersaturating the latter to make up all of said solution used in carrying out the method from a body of ammonium sulphate liquor in a crystallizing space below said scrubbing space, said contacting being effected by spraying under such pressure so as to disperse said solution in fine spray over substantially the whole cross sectional area of

coke oven gas through solutions containing sulphuric acid has long been known in practice as a means of extracting substantially all of the ammonia from coke oven gas and producing a useful byproduct, crystalline ammonium sulphate. The commercial practice of the art, however, developed along two more or less independent and parallel lines.

In 1940, most of the commercial installations in this country for the accomplishment of this purpose were saturators with one or more cracker pipes, the open ends of which were immersed to a depth of several inches in

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the space and permit solid crystalline particles and supersaturated liquid spray to fall into said body whereby the growth of ammonium sulphate crystals in said body is promoted, withdrawing crystals from said crystallizing space and adding sulphuric acid to the liquor at a rate so related to the rate at which the ammonia containing gas is passed into said scrubbing space as to effect the reaction of substantially all of the ammonia in the gas with the acid, and make up, for the acid combining with ammonia in the scrubbing space.

8. A method as specified in claim 7, in which the gas passes first through an inlet portion and thence through an outlet portion of said scrubbing space, and including the step of adding make-up acid mainly to the liquor sprayed into the last mentioned portion of the scrubbing space.

14. In a coke oven by-product plant including apparatus for producing ammonium sulphate crystals by scrubbing coke oven gas containing ammonia with an acidified ammonium sulphate solution, the combination with structure formed with a crystallizing space and a substantially unobstructed scrubbing space, and including wall structure surrounding said crystallizing space and said scrubbing space, non-blocking spray nozzles mounted in said structure, said scrubbing space having a lower liquor and crystal outlet arranged to discharge into said crystallizing space, and having a gas inlet and a gas outlet each spaced away from said nozzles, each of said nozzles being arranged to discharge a liquor spray and crystals into

a bath of supersaturated ammonium sulphate solution containing sulphuric acid. The gas was pumped downwardly through the cracker pipe and the liquid seal of the bath from whence it bubbled up through the bath and passed on to an exhaust pipe above the bath.

This method was fully effective in cleansing the coke oven gas of the ammonia to an acceptable degree. Since the bath was a supersaturated solution of ammonium sulphate, crystals of ammonium sulphate were formed in the bath, the heavy ones falling to the bottom of the bath from whence they could be removed for subsequent

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an adjacent portion of said scrubbing space, said nozzles being arranged to disperse said spray over substantially the whole cross sectional area of said scrubbing space, gas conduit means connected to said structure and communicating with said scrubbing space for passing coke oven gas into said scrubbing space through said gas inlet and for withdrawing gas from said scrubbing space through said gas outlet, means connected to said structure for withdrawing saturated ammonium sulphate liquor and crystals from said crystallizing space and spraying said liquor and crystals into said scrubbing space and comprising pumping means having inlet conduit means connected to said crystallizing space for the withdrawal of liquor and crystals therefrom, and having outlet conduit means for discharging liquor and crystals withdrawn from the crystallizing space and including a separate conduit connection to each such nozzle, and means for adding make-up sulphuric acid to the liquor passing from said crystallizing space to said nozzle means, at a rate so related to the rate at which the gas containing ammonia is passed into said scrubbing space that substantially all of the ammonia in the gas reacts with the sulphuric acid to form ammonium sulphate liquor and crystals, whereby substantially all of the ammonium sulphate liquor sprayed into said scrubbing space is liquor which has been previously withdrawn from said scrubbing space.

15. Apparatus as specified in claim 14, in which said gas conduit means includes a gas supply pipe having a horizontal

processing and sale for use as agricultural fertilizer. Sulphuric acid was constantly added to replace that consumed in the formation of ammonium sulphate.

This apparatus tended to form fine salt which would cake in solid form on the apparatus itself so that it was necessary from time to time to "kill" the bath with water and acid in order to remove salt deposits from the apparatus. At such times the production of crystals, of course, was interrupted, though the cleansing of ammonia from the gas was not.

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discharge end portion for passing a stream of coke oven gas horizontally through said gas inlet and through a portion of said scrubbing space adjacent to said gas inlet and in which a portion of the liquor spray discharged by said spray nozzles is passed into said scrubbing space portion adjacent said gas inlet.

16. Apparatus as specified in claim 14, including a pipe connected to said inlet conduit, means for connecting the latter to a source of cleaning fluid, and a valve in said pipe, whereby when said valve is open, cleaning fluid is sprayed into said scrubbing space through said non-blocking nozzles.

18. Apparatus as specified in claim 14, in which the structure forming the crystallizing space includes a vertically disposed, open ended pipe having its upper end open to receive ammonium sulphate liquor and crystals passing downward through said scrubbing space, and a receptacle of a larger horizontal cross section than said pipe and into which said pipe depends and which co-operates with said pipe to form a crystallizer space external to said pipe and receiving liquor adjacent its lower end through the open lower end of said pipe, first and second conduit connections to said receptacle at respectively low and said second conduit connection forming a portion of said pumping means through which the latter passes liquor and crystals to said separator and high levels, said first conduit connection forming a portion of said pumping through which the latter passes liquor and entrained crystals to said spray nozzles, a second receptacle, and an overflow connection through which liquor in the first men-

The cracker pipe installations required that gas be pumped against the head of the liquid seal of the mother liquor so that the pressure differential on either side of the saturator was as much as thirty-five inches of water. This operation was costly.

Numbers of people began to work on methods of reducing the pressure differential and the gas handling capacity of such saturators.

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tioned receptacle above said relatively high level overflows into said second receptacle.

19. In a crystallizing and reaction tank system for producing crystals of (NH4) 2SO4 by reaction of ammonia containing gas with H2SO4 solution, tank apparatus comprising a reaction tank section and a crystallizing tank section, said reaction tank section having an inlet for a conduit for passing the ammonia containing gas into an inlet portion of said reaction tank section, a spray nozzle with fluid rotating passage walls located adjacent said inlet so as to immediately contact the entering gas with spray reaction with the ammonia containing gas, a plurality of spray nozzles with fluid rotating passage walls located in an unobstructed portion of said reaction section, displaced from said inlet section, and arranged to cover the cross sectional area of said unobstructed portion with spray, and an outlet conduit for gas in said unobstructed portion, said crytallizing tank section being arranged to receive solution and crystals moving down from the bottom of said reaction tank section to said crystallizing tank section, a suspension conveying system including said crystallizing tank section, pumping means for conveying a suspension of crystals from a portion of said crystallizing tank section containing relatively large crystals to a crystal separating device, and conduit means connected to a portion of said conveying system which follows said portion containing relatively large crystals and which includes conduits through which suspensions of crystals are passed to the spray nozzles in the unobstructed portion of said reaction section and inlet means for the addition of fresh acid to said suspension conveying system.

Upon an application filed in 1943, Patent No. 2,423,794 was issued in 1947 to the plaintiff in this action for a saturator having a flared mouth on the cracker pipe. The flared mouth caused the gas to pass more or less horizontally through the bath before bubbling upward to the surface. It permitted the apparatus to be operated with the cracker pipe immersed less deeply in the bath while successfully handling a given volume of gas. During the 1940's a number of installations of saturators of this design were made in this country including one by the defendant, Koppers, for the defendant, Wheeling Steel Corporation, at its plant at Follansbee, West Virginia.

Another method of removing ammonia from coke oven gas and converting it into ammonium sulphate was also known in commercial practice. For convenience this will be referred to as the "unsaturated system." Unlike the cracker pipe saturator, it employed an unsaturated solution of accidified ammonium sulphate.

Passing gas upwardly through a tower through which an appropriate fluid was simultaneously being passed downwardly in the form of a spray or droplets had long been practiced as a means of removing dust and other substances from gases by reaction or absorption. As practiced for the removal of ammonia from coke oven gas, such towers, known as "scrubbers," in modern practice were packed with tile or other material. Gas was pumped into the bottom of the tower from whence it would flow upwardly through the spaces between the packing, while at the same time a solution of sulphuric acid, or of unsaturated ammonium sulphate containing sulphuric acid, was spread over the top of the packing

by perforated pipes, spray nozzles or other suitable means. As the liquid flowed over and down the sides of the packing material, it came into contact with the upwardly flowing gas. The sulphuric acid in the liquid reacted with the ammonia in the gas to produce ammonium sulphate. It had been found that such packed towers produced a more intimate contact of the gas and the liquid than an unpacked scrubber. In the packed tower the use of a spray at the top of the tower was principally for the purpose of dispersing the liquid over the top of the packing, while the reaction was effected primarily in the spaces between the packing.

In the packed tower system it was imperative that any solution of ammonium sulphate employed as the liquid be unsaturated. If at any place in the system the liquid was brought to a state of supersaturation, fine salt would quickly form to clog the system and interrupt its operation. The unsaturated ammonium sulphate solution was withdrawn from the bottom of the packed tower and passed through evaporators and crystallizers where it was brought to a state of supersaturation resulting in the formation of crystals of ammonium sulphate.

Though the cracker pipe saturator was in far wider use in this country, the Wilputte Coke Oven Corporation in 1941 turned back to the packed tower system. Since the gas did not have to be pumped against a liquid seal the pressure differential was much less than in the cracker pipe saturators, and while crystals could not be formed in the scrubbing space itself, it was claimed that production in the ancillary evaporators, crystallizers and other equipment could be so controlled as to produce

larger crystals of more uniform size than in the cracker pipe saturators.

Shortly before then synthetic ammomia plants had begun to produce ammonium sulphate in larger and more uniform crystals than was ordinarily produced by the cracker pipe saturators. This was a very desirable quality and it was thought by officials at Wilputte that all coke oven by-products plants would have to meet the standards of the synthetic ammonia plants if they were to maintain their markets for ammonium sulphate crystals when the end of World War II permitted the synthetic plants to turn again to that market.

With similar concern for the quantity and quality of the ammonium sulphate crystals produced, William Tiddy, Director of Research of Semet-Solvay Engineering Corp., in 1941, had turned back to scrubbers.

From the foregoing it may be seen that as commercially practiced in this country in 1946, the production of ammonium sulphate crystals from coke oven gas, was accomplished by two different systems, one of which, the cracker pipe saturator, operated with a supersaturated solution of ammonium sulphate in the saturator itself, while the other, the packed tower scrubber, could operate only with unsaturated solutions of ammonium sulphate in the scrubber. Each system had distinct advantages and disadvantages. Except, however, for the use of sprays to supplement the work of the cracker pipe, which will be described later, no one in commercial practice had combined principles of the two systems in one installation.

In 1946 the plaintiff, Otto, developed the idea that he could obtain substantially improved results by start-

ing with a scrubber of the type used in the unsaturated system, but stripped of all internal packing, grids or other obstruction, while spraying a solution of saturated ammonium sulphate containing entrained crystals, as used in the cracker pipe system, through spray nozzles. The spray nozzles were of a type which would result in a division of the liquid into fine droplets evenly distributed throughout the cross section of the spray. As coke oven gas was passed into the bottom of the spray tower, it passed through the sprays of saturated ammonium sulphate containing seed crystals and growth of those crystals began in the reaction area. In alternate apparatus the sprayed liquid and the growing crystals were collected in a crystallizing pool in the bottom of the tower or drawn off to a separate crystallizer. In the latter alternative, growth of the crystals and the formation of new ones continued as the liquid passed through the pipe from the bottom of the scrubber into the crystallizer.

Otto avoided the formation of masses of fine salt within the scrubbing space by intentionally directing the sprayed liquid against the walls of the scrubber. This was done in a volume and at a velocity which proved to be sufficient to prevent the formation of fine salt on the walls of the scrubber.

Otto's first commercial installation of his "all spray saturator" was at the Lackawanna, N. Y., plant of Bethlehem Steel Company. Engineers and officials of Bethlehem Steel Company had been persuaded by Otto that his idea might have substantial merit, but they were so skeptical of its worth that they required him to so design and construct the saturator that it could be con-

verted to a cracker pipe saturator in the event that the new idea proved impracticable or unworkable in operation. When this installation was completed in 1947 and was put in operation, its performance and results were demonstrated to be far superior to those possible under either of the systems previously practiced. Substantially all of the ammonia was removed from the gas while the production of crystals of good size and quality was substantially continuous in operation. The pressure differential of the cracker pipe saturators was greatly reduced, while the gas handling capacity was greatly increased.

Since the operation and maintenance of the spray saturator was comparatively easy, its outstanding results in handling larger quantities of gas and in producing crystalline ammonium sulphate, soon resulted in its general acceptance in the industry. Practical operators of coke oven by-product plants, observing the installation at Lackawanna, hailed it as revolutionary, while chemical engineers of the defendant, Koppers Company, Inc., in their training courses for their young engineers, explained and extolled the substantial advantages of the all spray saturator.

The defendant, Koppers Company, Inc., is a large engineering and construction company specializing in the design and construction of coke oven by-product plants and, since the plaintiff's demonstration of his Lackawanna spray saturator, it has installed a number of new saturators for coke oven plants. Since 1949, each of them has been a spray saturator, similar in principle and operation to the device described by the plaintiff in his patent. Otto Construction Company, of which the

plaintiff is the President, has also built a number of such saturators since 1947. Each of them has been of the all spray type. The record does not disclose that any other type of saturator has been built in this country since the plaintiff's practice of his claimed invention became general knowledge in the industry."

Many of these new installations of spray saturators have been in replacement of cracker pipe saturators. The cracker pipe saturator had come into widespread commercial use at or about the time of the first World War. The gas handling capacity of the new spray saturator was equal to that of four to five of these old cracker pipe saturators, and many of them were thus displaced by the new spray saturator.

In 1916 a number of cracker pipe saturators had been installed in the Follansbee, West Virginia plant of the defendant, Wheeling Steel Corporation. These were replaced by the defendant, Koppers, in 1948-1949 with two flared mouth cracker pipe saturators. While the flared mouth cracker pipe saturators were new and far superior to the 1916 saturators they replaced, they were in turn replaced with spray saturators when only three years old. This was an impressive expression of tribute by the defendants to the new all spray saturator.

The defendants do not deny the superiority of the all spray saturator or that Otto was the first to construct such a device for the production of ammonium sulphate in a coke oven by-products plant. They contend, however, that what Otto did was not invention in the sense of the patent laws because (1) he employed principles well-known to chemical engineers, (2) his

work was an evolutionary engineering advance resulting from the availability of materials (certain types of stainless steel and monel metal and effective means of welding them) the lack of which had prevented commercial practice of the known principles and (3) it was fully anticipated by prior patents and public uses. It becomes necessary therefore to examine the patents and uses claimed to be anticipatory and the contemporary work of others.

JEREMIASSEN

U. S. Patent No. 2,375,922

The patent upon which the greatest emphasis has been placed by the defendant, and by officials of the Patent Office at the time Otto's patent was being processed, is United States Patent No. 2,375,922 issued on May 15, 1945, to F. Jeremiassen upon an application filed September 15, 1939. This Patent, entitled "Treatment of Solutions to Obtain Solid Matter Therefrom," reveals a process for increasing the concentration of a solution by reacting the solution with gas so as to cause the solution to precipitate a solid. Reference is made to its use in connection with a solution of ammonium sulphate reacted with a gas containing ammonia to produce ammonium sulphate, but the gas is not described as coke oven gas, and it would seem that the purpose and function of his process would be more readily served by the use of a gas containing a much higher content of ammonia than coke oven gas.

Jeremiassen proposed to pump a solution of ammonium sulphate in an approximately saturated state to the top of a tower. From there it was caused to fall

by gravity in a "veil" or "freely falling shower" of liquid. Gas containing ammonia was introduced into a gas chamber, through which the veil or shower of liquid was falling. The chamber was so constructed that the gas, to be exhausted, had to pass through the shower of liquid. The walls of the gas chamber were carefully designed so that at no point would the veil or shower of liquid come into contact with any surface of the chamber until it fell into the pool of ammonium sulphate solution at the bottom. The solution was then withdrawn into a crystallizing chamber where it passed upwardly through crystals of ammonium sulphate.

Jeremiassen stated that his large volume of circulating solution produced a large contact surface between the liquid and the gas "without having to resort to the use of spray, or quite thin films of liquid as employed in scrubbers, as this would result in formation of fine salt and coatings caused by the limit of the metastable supersaturation being locally exceeded*****." He repeatedly specified and emphasized that at no point would the circulating solution exceed the limits of metastable supersaturation. He defined supersaturation within the metastable limit as being that "degree of supersaturation at which no crystals are formed."

The expert witnesses were not in agreement as to their definition of the word "metastable." On the one hand the witnesses for the defendants testified that it was an uncertain word and of indefinite extent but applied to that state of supersaturation within which the formation of new crystals at a given temperature and under specified conditions was comparatively small. They stated that it was a condition which was very

difficult to maintain. On the other hand the plaintiff's witnesses testified that solutions may be brought to a point above the saturation point and remain in a state of unstable equilibrium, without the formation or precipitation of a solid, for a comparatively short space of time. If a seed crystal is added to such a solution, the unstable equilibrium is upset and the solution becomes desupersaturated by an immediate precipitation upon the seed crystal and formation of others. Dr. Radasch, a witness for the plaintiff, performed a practical demonstration, bringing to the courtroom supersaturated solutions of sodium thiosulphate. By the introduction of a sodium thiosulphate crystal, the solution was immediately desupersaturated by precipitation of solids.

Whatever the differing opinions of the experts as to their understanding of the word "metastable," however, Jeremiassen has defined it for us as being within the limits of that degree of supersaturation within which no crystals are formed. Indeed in many ways, through the use of large volumes of liquid, the short time for the whole cycle of recirculation, the avoidance of any contact between the veil of liquid and any solid object, he emphasized the necessity of avoiding local supersaturation beyond the metastable limit at any place in the system other than the crystallizing chamber. Doubtless this would require precise control of the relative volume of the liquid and the gas and it is possible, as the defendants' experts contended, that it could not be maintained in practice, but Jeremiassen taught that it must be maintained.

Jeremiassen proposed that the circulating solution be passed upward through the bottom of the crystallizing

chamber. As the solution passed through crystals at the bottom of that chamber it became desupersaturated and the crystals were caused to grow and new ones were formed. Desupersaturated liquid was drawn off from the top of the crystallizing chamber for recirculation. The plaintiff's experts testified that unless the crystallizing chamber "is made impracticably large" or, assuming that the proportions of the diagram shown in the Jeremiassen patent were followed in an actual plant, crystals of ammonium sulphate would be present at the top of the crystallizing chamber and would be recirculated through the system. Witnesses for the plaintiff were in general agreement that if a plant were constructed in the proportions shown in the diagrammatic drawings of the patent, the recirculated liquor would contain some crystals, but they insisted that, while perhaps impracticable or uneconomic, they could design and construct a plant following the teachings of Jeremiassen in which the recirculated liquor would be free of crystals as Jeremiassen appears to have required.

The record does not indicate that any plant following the Jeremiassen patent has ever been built. Perhaps the difficulty of maintaining the circulating solution within the metastable limits and free of crystals, as emphasized by the experts, may explain why no such plant has ever been built. But Jeremiassen's invention is described in the specifications and claims of his patent, and it cannot be said to have taught a result which an expert witness now states would follow from what, to Jeremiassen, amounted to practical difficulties to be avoided. The testimony of the defendants' expert witnesses would seem to lead to the conclusion that the patent in suit was anticipated by Jeremiassen, but their

testimony was founded upon a misconception of the Jeremiassen patent, for the essential premise for the expert opinion was the theoretical operation of an actual plant if one were constructed in accordance with the diagrammatic drawings of the patent and in the precise proportions shown in those drawings.

Diagrammatic drawings are required to be included in a patent application, where appropriate, for the purpose of illustrating the principles described in the specifications and claims. Except in design patents, the proportions shown in the diagrammatic drawings are not critical and they do not purport to be scale or working drawings. Application of Nash, C.C.P.A., 230 F. 2d 428; Application of Olson, C.C.P.A., 212 F. 2d 590. So long as the drawings fairly illustrate the principles described in the specifications and the claims, the patent is not made invalid because a precise projection to scale of the dimensions of the drawings would not produce a useful or suitable result, for it is expected that anyone practicing the patent would so proportion the dimensions as to follow the statements of the principles of the invention and procure the practical result envisioned by the patentee. See *Crown Cork & Seal Co. v. Aluminum Stopper Co.*, 4 Cir., 108 F. 845.

One working in the field contemporaneously with Otto, with the Jeremiassen Patent in hand, presumptively, would have looked to the claims and specifications and the principles they express as illustrated in the diagrammatic drawings to discover the teachings of the patent. What Jeremiassen said and the principles he illustrates do not anticipate the patent in suit. it does not become anticipatory because, in the opinion of ex-

perts, an actual plant proportioned precisely in accordance with the diagrammatic drawings would not work in accordance with the principles and directions stated by Jeremiassen or because the practical difficulties he believed existed and sought to avoid in practice, might, by peradventure, have been found to be virtues. *Scelly Oil Co. v. Universal Oil Product Co.*, 3 Cir., 31 F. 2d 427.

The patent in suit requires the use of sprays under pressure, in contact with the walls of the scrubber and the circulation through the spray nozzles of ammonium sulphate solutions containing entrained crystals. The patent in suit requires precisely those things which Jeremiassen taught should be avoided. Indeed, the avoidance of those things, Jeremiassen stated, was essential to his invention and its practice.

TIDDY

U. S. Patent No. 1,997,757

In 1935 United States Patent No. 1,997,757 was issued to William Tiddy upon an application filed August 15, 1931, for a "Saturator for the Production of Ammonium Salts and Process for Making Such Salts." Tiddy stated that the principal object of his device was to produce ammonium sulphate crystals larger than those produced in the ordinary saturator. This he proposed to accomplish by rotating cylinders in tangential contact with the surface of an acid liquid causing a spray to be thrown up tangentially to the surface of the cylinder in a space through which "suitable ammonia-containing gas" was passed.

The liquor bath was in an elongated reservoir so that crystals formed near the top were required to pass

a substantial distance through the solution during which time they continued to grow until they reached a size substantially larger than those produced in the ordinary saturator and were ready to be withdrawn at the bottom.

Professor Radasch, a witness for the plaintiff, testified that he had worked with Tiddy prior to 1931 on various devices employing cylindrical rolls to produce a type of spray. These were in situations in which spray nozzles would not work, or at least Tiddy and Radasch believed that they would not. Though Tiddy, in his patent, did not refer to the presence of crystals at the top of his liquor bath, it was assumed by the expert witnesses that they would be present and would be thrown up in the spray by the rotation of the cylindrical rolls.

The device of the Tiddy patent bears little resemblance to the well-known spray scrubbers. It did purport by means of rotating cylinders to produce a spray of acidified liquid to react with ammonia in gases, but no plant was ever built in accordance with the teaching of Tiddy. Tiddy, himself, by 1941, had turned back to scrubbers operating on the unsaturated system as the best means of producing ammonium sulphate and later, as assignor of Semet-Solvay Engineering Corporation and Allied Chemical & Dye Corporation, obtained two patents upon claimed improvements in that art. The emphasis of his patent No. 1,997,757, was not on the method of obtaining the reaction but on the depth of the bath in which the crystals grew. The Tiddy patent had been public knowledge for more than eleven years, but neither the patentee nor the highly skilled engi-

neers of the defendant turned to it as the answer to the problem upon which they all worked. No such structure was built, but Tiddy continued to work in the art of the unsaturated system while the defendant, Koppers, was seeking to solve the problem with cracker pipe variants which will be described below.

Other Prior Patents and Publications Claimed to be Anticipatory

One of the other references in the prior art, patent No. 411,106 issued Nov. 18, 1890 to M. M. Monsanto shows a process for the vaporization of alkaline or saccharine liquids by passing air or some other appropriate gas through a rain of the liquid until the air or gas becomes saturated to or near the point of crystallization of solids. From the point of view of the defendants it adds nothing to Jeremiassen. The remainder of the prior patents and publications claimed to be anticipatory, disclose variants of scrubbers operated on the unsaturated system which is described above and which was well-known and had been in long use.

The Underwood Experiment

In 1942 a Mr. Underwood, Superintendent of the Coke Oven Plant of Bethlehem Steel Company at Bethlehem, Pennsylvania, undertook to modify old cracker pipe saturators to reduce the pressure differential. He installed, in the saturator, pipes with spaced perforations through which he circulated mother liquor from the saturator. The pressure was sufficient to cause the liquor to emerge from the perforations in the pipe under pressure and these jets of liquor were divided into drop-

lets by the use of splash plates. He reduced the depth to which the cracker pipe was immersed in the bath, his idea being to compensate for the inefficient operation of the cracker pipe by the splash plate sprays in the gas after it had bubbled through the mother liquor. Underwood did not get away from the cracker pipe. While the seal of the mother liquor was reduced, the gas still had to be pumped through a liquid seal and was not pumped into an unobstructed space as called for in the Otto patent.

The testimony is not entirely in agreement as to the operation of the Underwood modification of the cracker pipe saturator, but it is clear that considerable difficulty was encountered and that, after approximately two years, the experiment was abandoned altogether. Thereafter the old saturators at Bethlehem were replaced by new saturators of the Otto flared mouth cracker pipe type which employed no anciliary or other sprays of any sort.

Underwood was attempting to lower the pressure differential, which was a problem in the operation of his old cracker pipe saturators, but clearly he had no idea of abandoning the cracker pipe.

KOPPERS CRACKER PIPE VARIANTS

In the period 1943-1947 the defendant, Koppers, was itself experimenting with the recirculation of mother liquor in cracker pipe saturators much as Underwood had done. In its Monessen, Weirton, Seaboard and Aliquippa installations it used a spray of recirculated mother liquor with the addition of acid to supplement the operation of the cracker pipe. As Under-

wood's modification, these were only modifications of cracker pipe saturators in an effort to reduce the pressure differential, but in no way disclosed the concept of converting the open scrubber to the saturated system. Indeed, as the Underwood modification was abandoned and the saturators in Bethlehem replaced by Otto flared mouth cracker pipe saturators, so Koppers turned to the Otto flared mouth cracker pipe, and, in the period 1947-1949, the flared mouth cracker pipe without spray supplement appears to have been generally accepted by the defendants and others as the preferred apparatus and a major advance over the old art.

From the foregoing it is apparent that while there have been many developments and improvements in scrubbers operating on the unsaturated system and in cracker pipe saturators operating on the saturated system, no one had undertaken to convert the old unpacked scrubber to the saturated system. In the concept of passing coke oven gas through an unobstructed scrubbing space and passing through it saturated ammonium sulphate containing entrained crystals in the form of a finely divided spray under pressure, so that both absorption of the ammonia in the gas and the crystallization of ammonium sulphate occurred in the spray in the reaction zone, Otto displayed a new approach. Though he achieved the efficiency of the most efficient cracker pipe saturators, his sprays were not merely an incidental supplementation of the work of the cracker pipe in an effort to reduce somewhat the depth of the liquid seal, for he abandoned the cracker pipe with its liquid seal altogether. Nor

was it a mere improvement of scrubbers operating on the unsaturated system, for it did what everyone practicing and teaching in that branch of the art insistently avoided.

Where invention is clearly wanting, commercial success cannot lend validity to a patent. *Great Atlantic & Pacific Tea Company v. Supermarket Equipment Corporation*, 340 U. S. 147, 71 S. Ct. 127, 95 L. Ed. 162; *Ingersoll-Rand Co. et al v. Black & Decker Mfg. Co.*, 4 Cir., 192 F. 2d 270; *Vapor Blast Manufacturing Co. v. Pangborn*, 4 Cir., 186 F. 2d 230; *Murdock v. Murdock*, 4 Cir., 176 F. 2d 434; *Bulldog Electric Products Co. v. General Electric Co.*, 4 Cir., 105 F. 2d 466. Where, however, it appears that the claims of the patent contain elements of novelty and invention within the meaning of the Act, commercial success tends strongly to overcome the defense that what was done was obvious to other persons of great skill shown to have been working in the same field in an effort to accomplish the same objective. *Loom Co. v. Higgins*, 105 U. S. 580, 26 L. Ed. 1177; *Lyon v. Bausch & Lomb*, 2 Cir., 224 F. 2d 530; *L-O-F Glass Fibers Co. v. Watson*, D. C. Cir., 228 F. 2d 40. This is particularly so in a field in which many highly trained engineers had been actively working and for years had been attempting to overcome the disadvantages of the methods and apparatus then known and the difficulties inherent in their operation. When the demonstrated success of plaintiff's all spray saturator caused practical men in the coke oven industry to hail it as revolutionary, highly qualified engineers in the employ of the defendant, Koppers, to teach its advantages and its virtues over all other methods and apparatus, the replacement of installations of the old apparatus

(some of them only recently installed) with new all spray saturators, it is persuasive that it was not a thing readily apparent to other engineers skilled in the art.

Koppers itself did not complete its first installation of an all spray saturator until 1949. It first attempted to use splash plate sprays, but found that they would not operate with the requisite efficiency so that they were replaced with Spraco nozzles which had been specifically mentioned in the patent in suit. While Koppers thus appears to have copied all the essentials of Otto's invention, bearing in mind the revolutionary impact of the invention upon the industry, there is no explanation why Koppers did not turn to the all spray saturator earlier, if Otto's concept was apparent to its engineering personnel prior to the demonstrated success of Otto's installation. If there was any want of essential materials for the practice of the invention prior to 1946, they clearly were not wanting at that time. The use of stainless steel in the Seaboard and Otto flared mouth cracker pipe saturators, in the Monessen and Weirton cracker pipes installed in 1941 and the recirculation of mother liquor containing entrained crystals in the Monessen, Weirton and Seaboard installations of the defendant, Koppers, all indicate that it was not a want of materials which made the practice of the invention impossible prior to 1946, but rather it was the lack of the concept until it was demonstrated in practice by Otto.

Otto does not claim that his invention embodies any new discovery of chemical principles. His is a combination patent, each individual element of which was known in the art, but the combination and its concept were new, producing clearly improved results. What has

been said above of the work of many skilled chemical engineers in the field, the impact of this patent upon the industry and the defendants' prompt adoption of the patented apparatus demonstrates its merit and utility and forecloses the suggestion that the combination was obvious to others working in the field. The oft quoted statement of Judge Hough in *Kurtz v. Belle Hat Lining Co.*, 2 Cir., 280 Fed. 277, 281 is appropriate here:

> "The imitation of a thing patented by a defendant, who denies invention, has often been regarded, perhaps especially in this circuit, as conclusive evidence of what the defendant thinks of the patent, and persuasive of what the rest of the world ought to think,"

a principle well recognized in this Circuit. *Ackermans v. General Motors Corp.*, 4 Cir., 202 F. 2d 642; *Black & Decker Mfg. Co. v. Baltimore Truck Tire Service Corp.*, 4 Cir., 40 F. 2d 910.

Revolutions, even in one branch of an industry, are infrequently the product of old ideas. Particularly in a field in which highly trained and skillful engineers were working, on various approaches, to achieve the result, the imitators can hardly be heard to say they knew all the while that the answer lay in the concept which, upon its disclosure, made their own work obsolete. This Court, under these circumstances, cannot find the concept wanting in inventive novelty.

Much of the argument in this Court involves the presumption of validity which automatically attaches upon the issuance of a patent. 35 U. S. C. A. 282; *Diamond Rubber Co. v. Consolidated Rubber Tire Co.*, 220

U. S. 428, 55 L. Ed. 527; *Baker-Cammack Hosiery Mills v. Davis Co.*, 4 Cir., 181 F. 2d 550, a presumption which is strengthened when, as here, there were extensive administrative proceedings concerned with the prior art, *Reynolds v. Whitin Machine Works*, 4 Cir., 167 F. 2d 78.

The presumption it attacked first on the ground that relevant prior art was not cited by the Examiner in the Patent Office, particularly Tiddy, Patent No. 1,997,757. The patent in suit, however, was issued upon an application which was a continuation in part and consolidation of several prior copending applications, in one of which the Tiddy patent was cited. In the proceedings on the superseding application the Examiner (the same individual who had handled the earlier applications) was relying only upon Jeremiassen as being anticipatory, but reference was made to the earlier applications and the claim that the Tiddy patent was not cited or considered as a relevant reference in the Patent Office cannot be sustained. 35 U.S.C.A. 120. See the Opinion of Judge Soper in *Gibbs v. Montgomery Ward & Co.*, D. C., Md., 19 F. 2d 613, 616, aff'd. 4 Cir., 27 F. 2d 466.

Other patents and publications, particularly a German handbook for engineers, relating to the practice of the "unsaturated system" were not record references in the Patent Office, but other patents and publications in that branch of the old art were record references. Astute and enterprising attorneys can always find references not of record in the Patent Office, but if they do not involve some substantial element in the defense of anticipation which was not considered by the Patent Office, the failure to make them record references cannot weaken the statutory presumption.

The presumption of validity is next attacked upon the assertion that the patentee's use of the term "spraying by whirling motion" in his claims No. 1, 2 and 4 was a misrepresentation which misled the officials of the Patent Office. The patentee, however, clearly disclosed to the Patent Office that he was referring only to the Spraco nozzle, as disclosed in an expired patent, No. 1,101,264 issued to one Eneas in 1914 and which was produced commercially by the Spray Engineering Co. of Somerville, Mass. This nozzle employs stationary turbine vanes which cause the major portion of the liquid to be given a "rapid swirling motion." A center jet strikes the rotating mass of liquid to produce a spray outside the nozzle of "equal density across its section." The plaintiff in this case stated clearly that the "whirling motion" occurred within the nozzle, not outside, and we cannot assume that the Examiner, with the Eneas Patent and the literature of Spray Engineering Co. before him, could have supposed that the droplets, after leaving the nozzle, would take a course in defiance of elementary laws of physics.

What the patentee sought was a spray having a uniform density throughout its cross section which was supplied by the commercially available Spraco Nozzle with its "swirling motion" within the nozzle. That it was a matter of some importance is demonstrated by the fact that the defendant, Koppers, in its first "all spray saturators" attempted to use splash plate sprays, but, finding them unsatisfactory, replaced them with Spraco nozzles.

The defendants' major effort to impair, or destroy, the presumption of validity ordinarily attaching to a patent, is of no avail.

Without aid of that presumption, however, we have found the plaintiff's invention to be meritorious. The plaintiff has accomplished a real innovation in the industry, the impact of which has changed the course of the practice of ammonium sulphate production. For just such innovations, the Patent Act was designed, and the plaintiff is entitled to its protection.

The judgment of the District Court is reversed and the cause remanded for further proceedings consistent with this opinion.

Reversed and Remanded.

IN THE

Supreme Court of the United States

OCTOBER TERM, 1957

No. 660

KOPPERS COMPANY, INC.,

and

WHEELING STEEL CORPORATION,

Petitioners,

vs.

CARL OTTO,

Respondent.

BRIEF IN OPPOSITION

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BRIEF IN OPPOSITION

Question Presented

Petitioners' "Questions Presented For Review", stated on pages 2 and 3 of their Petition, do not give this Court an accurate picture of the proceedings below and for that reason respondent is dissatisfied with their presentation. The actual question presented to this Court by this case is nothing more than the correctness of the action of the Court of Appeals for the Fourth Circuit reversing the decision of the District Court for the Northern District of West Virginia in an ordinary patent infringement case. Respondent believes that this Court can better appreciate what the appellate court below did, if it considers the

questions which were actually presented to that court as grounds for reversal of the trial court. Respondent, therefore, restates for this Court, as the only questions truly involved, the text of the non-procedural questions which he presented to the Court of Appeals:

"The Principal Question:

Did the District Court misinterpret 35 U. S. C. § 103 in applying the law to the facts of this case, proffered and of record, and, in consequence, err in concludi g that the Otto spray saturator innovation (which the Court itself found to be embodied in defendants' accused acts) does not meet the test of patentable invention, although its introduction had changed the practices of a whole industry?

Ancillary Questions:

2. Did the District Court err in giving slight weight to the actual history of ammonium sulphate production in by-product coke oven plants as it was affected by the successful demonstration of the patented invention and in placing controlling reliance on *post litem* theoretical analyses of prior art structures defendants do not use?

3. Did the District Court err in its understanding of the law governing the patentability of combinations in concluding that, because the chemical reaction in the Otto spray method and apparatus was old and each of the separate manipulative steps and apparatus parts used had been known and used before in other environments, the Patent Office was wrong in granting the patent in suit, notwithstanding the long recognition of the desirability of the advantages attained by Otto and the prompt adoption of his contribution by the industry to the substantial exclusion of the prior art?

4. Did the District Court clearly err in finding as a fact that some of the most pertinent prior art was

not cited by the Patent Office when no prior art advanced by defendants is more pertinent than the Jeremiassen and Monsanto references listed in the patent in suit and when the most pertinent of the supposedly overlooked prior art had been cited in plaintiff's earlier-filed copending application?

5. Did the District Court clearly err in finding as a fact that the Patent Office was misled by the term 'spraying by whirling motion' which appears in method claim 1 in suit when the stated basis for said term is set forth in the specification by reference to an expired U. S. patent and when the parallel limitation in apparatus claim 19 in suit is clearly expressed in terms of the structure of that expired patent?

6. Did the District Court err in giving slight weight to the recently enacted statutory presumption of validity, 35 U. S. C. § 282, and to the long standing statutory requirement that the Patent Office Board of Appeals be made up of persons of competent legal knowledge and scientific ability, 35 U. S. C. § 7, and, in consequence, further err in overruling that Board on substantially the same record it had before it?"

Statement

The most accurate, complete and yet succinct statement of this case known to respondent is the opinion of the Court of Appeals below. That opinion should be read in connection with the actual "Questions", reproduced above, which that court was considering. So read, petitioners' suggestion that that opinion merely "brushes aside" the judgment of the trial court is untenable. On the contrary, the Court of Appeals has made a carefully considered holding that the District Court was guilty not only of errors of law, but also clear errors of fact. These are *both*, of course, matters which courts of appeals have not only the power, but the *duty* to correct.

ARGUMENT

1. The Petition fails to state any reason for Supreme Court review of this case not equally applicable to every patent infringement action in which a Court of Appeals reverses a District Court to sustain the patent in suit. Respondent knows of no facet of fact or law involved that makes this other than an ordinary patent infringement case.

Here suit was brought by the patentee in a district in which accused apparatus was being used to practice an accused process against the user of the accused apparatus and against the construction company which had supplied it.* The action was tried on the merits in due course. The trial court found the patent to be infringed, if valid, but in a lengthy opinion concluded that the patent was invalid. It appeared to respondent, the patentee, that this conclusion was incorrect and that the District Court's specific errors required an affirmative answer to each of the "Questions" reproduced above. Appeal was taken to correct these errors. The matter was carefully briefed by both sides to expose to the Court of Appeals for the Fourth Circuit all significant contentions of fact and law, including every argument now advanced by petitioners. That court, consisting of Chief Judge Parker and Circuit Judges Sobeloff and Haynsworth, unanimously agreed with respondent that the District Court had clearly erred. We submit that this Court of Appeals is well aware of the provisions of Rule 52(a) of the Federal Rules of Civil

* The record shows (I, 70, 113; II, 406) that apparatus substantially identical to that accused here is located in at least the Third and Fifth Circuits and that there is at least one other major company, Allied Chemical, supplying apparatus which respondent has charged to infringe. Hence, the rationale of *Schaible-Schwarz Co. v. Cleveland Trust Co.*, 305 U. S. 47, 50 does not afford a reason for granting certiorari here.

Procedure and has been, as heretofore,* conscientiously followed its powers and duties in this respect as outlined for it by this Court in *United States* v. *Gypsum Co.*, 333 U. S. 364, 394-5 (1948).

Let us take, for example, Finding 21 about the Patent Office Examiner having been "deceived", the reversal of which so exercises petitioners. The record shows it to have been based on inferences drawn from indisputable Government records. No testimony from the supposedly deceived Patent Office personnel was adduced. A court of appeals can determine both the text of records and their implications equally as well as a trial judge, *Orvis* v. *Higgins*, 180 F. 2d 537 (2 Cir. 1950); *cert. den.* 340 U. S. 810 (1950). In the instant case, reversed Finding 21 of the trial court was, in its own language, one about "the sense" of a certain "term" as it was used in documents forming part of the ~~cited~~ Patent Office record, and it is too elementary to require citation that the interpretation of documents is ordinarily a question of law for the court, even in a jury trial. Respondent cannot imagine an area in which a court of appeals can more properly hold a finding of fact of a trial court clearly erroneous.

The real issue of this case has been the application of 35 U. S. C. § 103 to the facts. It was not seriously contested that the patent in suit was not infringed in terms or that its claims were "anticipated" under 35 U. S. C. § 102; the contest centered about the issue of "invention". Another Court of Appeals on the necessarily different facts involved in considering another patentable invention in 1957 applied the same well-understood principles and reached the same conclusion, namely that the District Court had misapplied the law to the facts and had wrongly held the patent invalid. *Fisch* v. *Gould*, 246 F. 2d 5 (3 Cir. 1957). This Court *denied* certiorari on January 6, 1958 (October Term 1957, No. 605).

* *E.g. United States* v. *Adams*, 218 F. 2d 276, 278 (4 Cir. 1954).